BS EN 12730:2015

BSI Standards Publication

Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of resistance to static loading

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National foreword

This British Standard is the UK implementation of EN 12730:2015. It supersedes BS EN 12730:2001 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee B/546, Flexible sheets for waterproofing and water vapour control.

A list of organizations represented on this committee can be obtained on request to its secretary.

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English Version

Flexible sheets for waterproofing - Bitumen, plastic and rubber sheets for roof waterproofing - Determination of resistance to static loading

Feuilles souples d'étanchéité - Feuilles d'étanchéité de toitures bitumineuses, plastiques et élastomères - Détermination de la résistance au poinçonnement statique

Abdichtungsbahnen - Bitumen-, Kunststoff- und Elastomerbahnen für Dachabdichtungen - Bestimmung des Widerstandes gegen statische Belastung

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 12730:2015) has been prepared by Technical Committee CEN/TC 254 “Flexible sheets for waterproofing”, the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2015 and conflicting national standards shall be withdrawn at the latest by October 2015.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 12730:2001.

Compared to EN 12730:2001, in this new version of EN 12730 an additional Test Method C has been introduced in order to comply with extended experience gained in the use of plastic roofing sheets. Additionally a sample size reduction for Method B was introduced as well as an update specification of the soft support polystyrene (EPS) boards.

This European Standard is intended for characterisation and classification of bitumen, plastic and rubber sheets as manufactured or supplied before use. This test method relates exclusively to products or to their components where appropriate, and not to waterproofing membrane systems composed of such products and installed in the works.

This test is intended to be used in conjunction with product standards for bitumen, plastic and rubber sheets for roof waterproofing.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard specifies a test for puncture by static loading for roofing membranes. Mechanical stress on membranes varies from static long-term loads to dynamic short-term loads. This method represents the static category of load where the stress is applied over a period of time.

This European Standard may also be applied for waterproofing.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 13163, *Thermal insulation products for buildings - Factory made expanded polystyrene (EPS) products - Specification*

EN 13416, *Flexible sheets for waterproofing - Bitumen, plastic and rubber sheets for roof waterproofing - Rules for sampling*

3 Terms and definitions

For the purposes of this document, the following term and definition applies.

3.1
surface
upper side of the sheet, as used in situ

Note 1 to entry The surface is usually the inside of the roll.

4 Principle

The principle of the test is to apply a concentrated load over a period of time, through a puncturing tool onto the surface of the membrane, when lying on a specified soft support (method A or method C) or hard support (method B). The choice of the appropriate test method for the different kind of membranes and the fields of applications shall be defined in the relevant product standards.

For the determination of resistance to static loading on soft support Method A is typically used for sheets that do not require protective measures when mechanical loads such as ladders, scaffoldings or other mounts are applied on them. Method C is intended for sheets which require the use of a protection layer in such construction situations.

5 Apparatus

5.1 General

The testing apparatus consists of parts indicated in 5.2 to 5.6 (see Figure 1).

5.2 Guide rail

The guide rail holds the loading rod in a vertical position. The vertical movement of the puncturing tool from the surface of the test specimen can be limited to (10 ± 2) mm by the guide rail.

5.3 Loading rod

The loading rod has the puncturing tool at the lower end and a support for the loading discs in the middle. The loading rod and puncturing tool are calibrated with the support disc to have a mass of 2 kg.

5.4 Loading discs

A complete set of loading discs contains one disc with a mass of 3 kg and three discs with a mass of 5 kg.

5.5 Puncturing tool

The puncturing tool is in the shape of a 10 mm diameter ball with a 5 mm diameter thread for attachment to the loading rod. The puncturing tool is made to the following specification:

a) formed in steel material

b) hardened to 50 HRC

c) ball diameter (10 ± 0,05) mm

d) surface, unmarked and polished.

5.6 Supports and test frame

5.6.1 General

Two types of supports in accordance with 5.6.2 or 5.6.3 can be used.

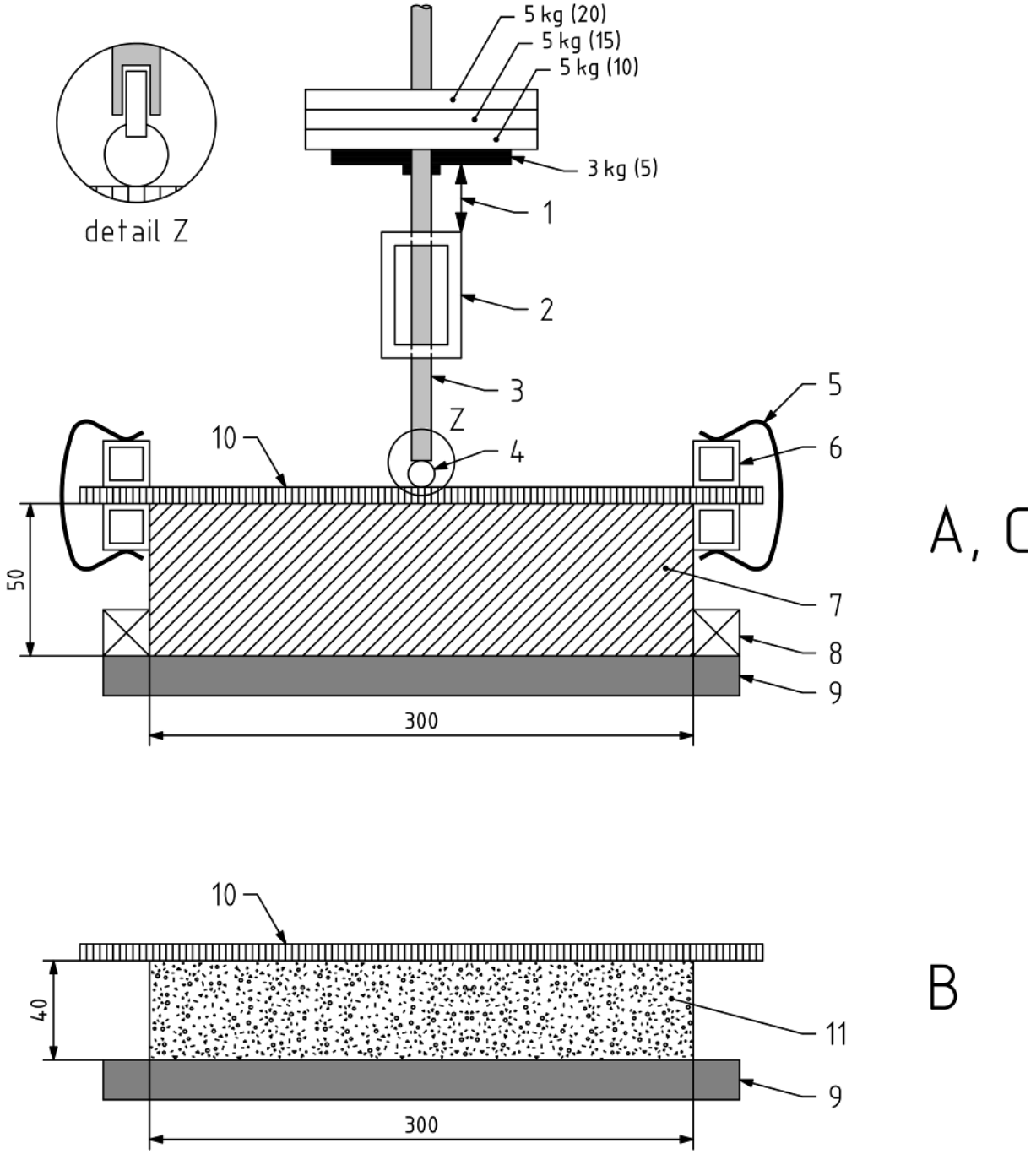
5.6.2 Soft support to be used with Method A and Method C

The test specimen is fixed in a clamping frame and laid directly in contact with the support. The inside dimensions of the frame are 300 mm × 300 mm. The clamping frame shall not allow movement exceeding 1 mm of the sample during the test. If necessary the clamping frame (No. 6 in Figure 1) may contain spikes or nails to minimize the movement of the sample to less than 1 mm during the test.

The support is expanded polystyrene (EPS-Quality CS(10)150, see EN 13163) with sizes 300 mm × 300 mm × 50 mm. The support shall be centred below the sample (Figure 1).

5.6.3 Hard support to be used with Method B

The test specimen is loose laid directly onto a concrete paving slab with sizes 300 mm × 300 mm × 40 mm. The surface of the concrete shall be even and without defects. The support shall be centred below the sample (Figure 1).



Key

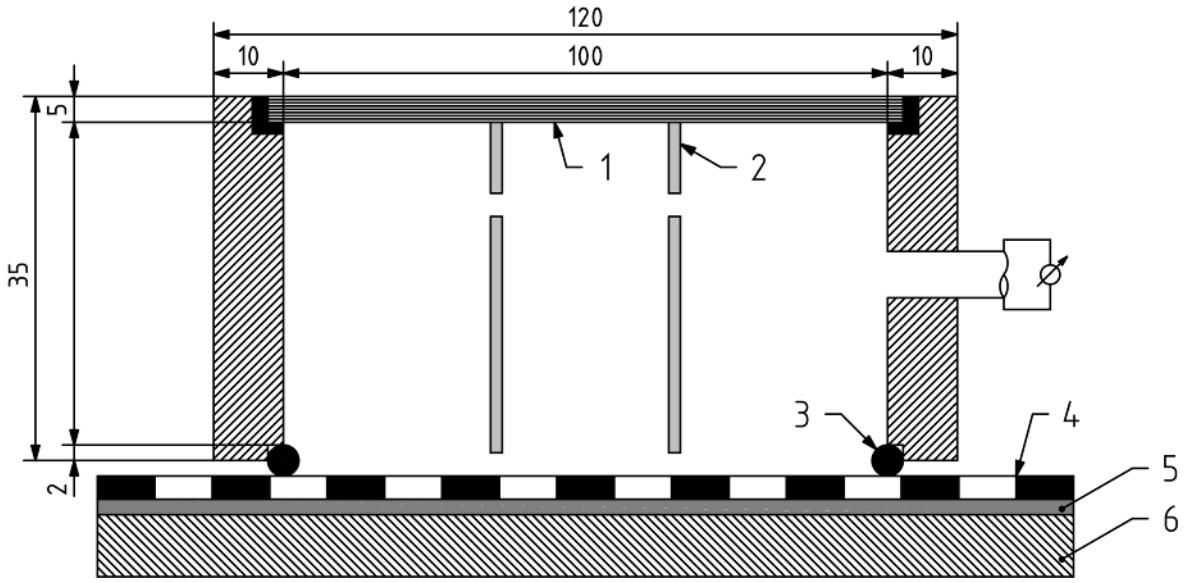
1	Maximum downward movement 40 mm Method A, 10 mm Method C	7	EPS (300 mm × 300 mm × 50 mm)
2	Guide rail	8	Frame to centre the EPS (e.g. wood)
3	Loading rod	9	Rigid support plate
4	Ball puncturing tool, diameter 10 mm	10	Test specimen
5	Clamp	11	Concrete (300 mm × 300 mm × 40 mm)
6	Frame profile (20 mm × 20 mm)	A,C	Soft support
		B	Hard support

Figure 1 — Example of static test arrangements

5.7 Vacuum or pressure device

A vacuum device or a pressure device shall be used for the verification of possible perforation. The inner diameter of this device applied to the specimen shall be at least 20 mm. Figure 2 shows an example for a vacuum device.

Dimensions in mm



Key

1	Glass plate	4	Test specimen
2	Transparent plastic tube	5	Air permeable layer
3	Gasket	6	Support

Figure 2 — Example of a vacuum device

6 Sampling

Test samples shall be taken in accordance with EN 13416.

7 Preparation of test specimens

The test specimens with dimensions (550 mm × 550 mm) ± 2 mm for method A and method C and (300 mm × 300 mm) ± 2 mm for method B are taken right across the width of the roll excluding 100 mm from the edges. The number of test specimens shall be 3 per loading stage for each method.

The test specimens are conditioned at least 24 h at the specified test conditions.

8 Procedure

8.1 General

Testing is carried out at a temperature of (23 ± 2) ºC.

For every test at each loading interval a new test specimen shall be used, and a new polystyrene panel for the soft support test (see also 8.2).

The test specimen is laid on the horizontal support with the surface upwards.

The puncturing tool is positioned at the centre of the test specimen.

The testing is carried out with three parallel test specimens in intervals of loading starting with 5 kg. The load is then increased by steps of 5 kg until perforation occurs, or up to a maximum load of 20 kg. The duration of loading shall be 24 h for each loading interval.

The load is applied carefully, without shock.

After each loading interval the test specimens are examined for a possible puncture by coating the surface where the load has been applied with a soap solution between (7 ± 2) min after the test. A pressure difference of 15 kPa (0,15 bar) is applied to the area where the load has been applied by means of a vacuum or pressure device with the lower pressure at the surface of the sheet. If after 60 s no air bubbles are visible, the test specimen is considered not punctured.

The material under testing is considered to resist the given load when three out of three test specimens are not punctured.

8.2 Method A

When testing on soft support the test specimen is fixed in the clamping frame.

The downward movement of the ball from the surface of the test specimen should be limited to 40 mm as shown in Figure 1.

8.3 Method B

When testing on hard support the test specimen is loose laid on the concrete paving slab.

8.4 Method C

When testing on soft support the test specimen is fixed in the clamping frame.

The downward movement of the ball from the surface of the test specimen shall be limited to 10 mm as shown in Figure 1.

9 Expression of test results

The resistance to static loading is expressed as the load which has not caused leakage of the flexible sheet for roofing or waterproofing in three out of three parallel test specimens according to the method applied (method A, method B or method C).

10 Test report

The test report shall include the following information:

a) all details necessary to identify the product tested;

b) a reference to this European Standard (EN 12730) and any deviation from it;

c) information on sampling in accordance with Clause 6;

d) details of preparation of the test specimen in accordance with Clause 7;

e) information on the test procedure, indicating the method used (A,B or C) (Clause 8);

f) the test results in accordance with Clause 9;

g) the date of the test.

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